more has been observed in the United States fifteen times during the past twenty-six years. In some cases the velocity of the spirally inflowing winds must actually be less than the progressive movement of the disturbance as a whole. This was probably true on the following occasions when the mean velocity of the cyclone center exceeded 70 miles an hour:

December 26–28, 1880, 75 miles an hour; February 1, 1881, 75 miles an hour; February 8–9, 1884, 81 miles an hour; December 21–22, 1884, 79 miles an hour; February 21, 1894, 75 miles an hour.

These are average velocities for the whole path of the storm, but the rate is never uniform, and no doubt at times the speed of these storms was even greater. Hann states that the maximum velocities known to him for Europe are—

December 16, 1869, and November 10–11, 1875, 70 miles an hour; March 12–13, 1876, at Hamburg, 76 miles an hour.

The average velocity of anticyclones is a matter of not less importance, but the values found are not so certain on account of the difficulty of fixing exactly the centers of high pressure areas. The data in the MONTHLY WEATHER REVIEW enable us to calculate the mean rate of movement for the period of only sixteen years from 1888 to 1904. The results will be found in Table 2, mean velocities and number of anticyclones in the United States, 1888–1904. The annual mean is 25.6 miles an hour, which is only 10 per cent less than the speed of cyclones. The maximum velocity is found in January, 29.5 miles, and the minimum in August, 22.1 miles. The maximum velocity of anticyclones rarely exceeds 60 miles an hour.

A COURSE IN DYNAMIC METEOROLOGY.

Dr. Arthur Schuster, the eminent professor of physics in Owen's College, Victoria University, Manchester, England, has contributed funds for the maintenance of a readership in dynamic meteorology at some university in the British Isles. The appointment to this position seems to have been intrusted to the Meteorological Committee of the Royal Society, and the first incumbent is to be Mr. Ernest Gold, M. A., Fellow of Saint John's College, and superintendent of instruments in the Meteorological Office at London. He will hold this position for three years, or until October, 1910.

Meteorology owes a debt of gratitude to Professor Schuster for the first recognition of dynamic meteorology, or the mechanics of the earth's atmosphere, as a subject worthy of special recognition by British universities. Will not some American patron of science do as much for an American university?—*C. A.*

WEIGHT OF SLEET ON TELEGRAPH WIRES AND TREES.

Mr. P. H. Smyth, Local Forecaster, sends the following extract from the daily journal of the Cairo, Ill., station, for the date January 30, 1902:

In order to give an idea of the thickness of ice on branches of trees the following illustration is given: A twig measuring 23½ inches in length, tapering from $\frac{5}{16}$ of an inch to $\frac{1}{8}$ of an inch in diameter, and weighing $\frac{5}{8}$ of an ounce, was incased in ice weighing, when melted, 12¾ ounces, troy weight. The twig was obtained before any melting of ice had taken place.

ON THE DEPRESSION IN THE VALUE OF THE TOTAL INTENSITY OF THE SOLAR RADIATION IN 1903, ACCORDING TO MEASUREMENTS MADE AT THE CENTRAL STATION OF THE POLISH METEOROLOGICAL SERVICE AT WARSAW.

By LADISLAUS GORCZYŃSKI, D. Sc. Dated Vienna, Austria, February 8, 1907.
[Translated by Chester L Mills.]

INTRODUCTION.

In the MONTHLY WEATHER REVIEW (Vol. XXXII, No. 3, pp. 111–112, 1904) was reproduced a note published by us in the Comptes Rendus of the Academy of Science of Paris (T. 138, 1904, pp. 225–258) on the subject of a considerable diminution in the total value of the intensity of solar radiation, determined at Warsaw by measurements made regularly since 1901 at the Central Station of the Polish Meteorological Service.

This short note, of a provisional character, necessarily requires correction and completion in order to accord with the results of five years of measurements (1901–1905); especially the numerical values formerly given for the years 1901, 1902, and 1903 at Warsaw, have been recognized as not being correctly exprest in gram-calories, because of a mistake in the old theory of the Ångström-Chwolson type of actinometer. That mistake consists, as the results recently acquired show, in the inadequacy of converting actinometric measures by means of an instrumental "constant". This source of error is very important, and we shall speak of it further on. (See section 1.)

In a work[1] recently published there are discust the results of five years' measurements (1901–1905) at Warsaw, which were definitely reduced to gram-calories, in accordance with the modified theory, by means of variable coefficients of transmission established by numerous comparisons with the electrical compensation pyrheliometer. We took advantage of that occasion to communicate, in an extract, the newly established results on the subject of the march of the solar depression at Warsaw; these results should replace those of the preceding note, published in 1904 in the MONTHLY WEATHER REVIEW.

This communication having the character of a monograph, and referring only to Warsaw, we shall occupy ourselves here neither with the literature[2] of the question nor with the important measurements which have been made in other places. We shall only recall that the diminution of solar radiation of which we shall speak was observed, independently, in Europe by M. H. Dufour and in America by Mr. H. H. Kimball. It appears now that Mr. Kimball was the first to observe the fact of the depression, altho the first notice published on the subject belongs to M. Dufour.

1. *Apparatus.*—In the following measurements at Warsaw, an actinometer of the Ångström-Chwolson type was used, which was constructed in 1893 by Prof. O. Chwolson, and described in detail in an important memoir under the title, "Actinometrische Untersuchungen zur Construction eines Actinometers und eines Pyrheliometers" (Wild's Repertorium für Meteorologie. Vol. 16, No. 5, 1893).[3] This instrument (see fig. 1, Ångström-Chwolson actinometer, type of 1893) belongs to the so-called dynamic type of actinometers; it is based on the method employed in 1887, by Prof. K. Ångström. The essential point of the latter method consists in the simultaneous measurement of the differences of temperature between two identical bodies, one of which is exposed to the sun while the other is in the shade (and vice versa).

The definitive formula for the actinometer of the Ångström-Chwolson system is of form:

$$q = K\omega \quad \ldots\ldots (1)$$

$$\text{where } K = \frac{2c}{s} \quad \ldots\ldots (2)$$

$$\omega = \frac{1}{t}\,\frac{\theta_2^2 - \theta_1\theta_3}{\theta_1 - \theta_3} \quad \ldots\ldots (3)$$

where q = the intensity of the solar radiation referred to a unit of surface exposed normally; c = the thermal capacity;

[1] Lad. Gorczyński. Sur la marche annuelle de l'intensité du rayonnement solaire à Varsovie et sur la théorie des appareils employés. 8vo., VIII, 202 pages, with 2 plates, 1906. (Wende and Co., Booksellers, Warsaw.)

[2] That literature may be found in the works of Messrs. H. H. Kimball, S. P. Langley, H. Dufour, R. Holm, etc., also in our own work of 1906, cited above.

[3] See also Weather Bureau Bulletin No. 11, pp. 721–725.